

1 mid-IR wavelength of (2.7 - 3.2) microns;
2 selecting a beam spot controller mechanism, said spot controller consisting of an internal
3 magnetic coupler integrated inside the laser cavity having a pin-hole size of about
4 (2-10) mm;
5 focusing the output beam to a spot size of about (0.05-2.5) mm on the corneal surface;
6 selecting a scanning mechanism for scanning said selected laser output beam;
7 coupling said laser beam to a scanning device for scanning said laser beam over a
8 predetermined corneal surface area to remove corneal tissue, whereby a patient's vision
9 is corrected by reshaping the cornea.

10
11 21. A method for improving presbyopic patient's vision by removing a portion of the sclera
12 tissue from an eye of a patient, said method comprising the steps of:

13 selecting an ablative laser for removing sclera tissue by focusing said ablative laser
14 to a spot size of about (5-800) microns on the corneal surface;

15 selecting a scanning mechanism for scanning said ablative laser;

16 coupling said ablative laser to a scanning device for scanning said ablative laser over a
17 predetermined area outside the corneal limbus to remove said sclera tissue, whereby a
18 patient's near vision is improved by the increase of ~~the lens accommodation~~ ^{the corneal lens accommodation}.

19
20 22. A method of claim 21, in which said ablative laser is a gas laser having an output
21 wavelength of about (2.7-3.2) microns, energy per pulse of about (0.5-15) mJ on corneal
22 surface and a pulse duration less than 150 nanoseconds;

23 23. A method of claim 21, in which said ablative laser is a mid-IR solid-state laser having a
24 wavelength of about (2.7-3.2) microns.

25 24. The method of claim 21, in which said ablative laser includes pulsed radiation generated by
26 transverse electrical discharge carbon dioxide laser which is frequency-doubled into a laser
27 having a wavelength of about (5.6-6.2) microns, energy per pulse of about (2-15) mJ on the
28 corneal surface.

29 25. A method of claim 21, in which said ablative laser is a diode laser having a wavelength of
30 about 980 nm.

31 26. A method of claim 21, in which said ablative laser is a diode laser having a wavelength of
32 about (1.4 - 2.1) microns.

33 27. A method of claim 21, in which said ablative laser is a diode-pumped Er:YAG laser having a
34 wavelength about 2.9 microns and a pulse duration less than 500 microseconds.

35 28. A method of claim 21, in which said ablative laser is an ultraviolet laser having a wavelength
36 of about (190-310) nm.

37 29. A method of claim 21, in which said sclera tissue is coagulated by a laser having a
38 wavelength of about (0.5-3.2) microns, an average power of about (0.1-5.0) W on the corneal
39 surface, spot size of about (0.1-1.0) mm, and a pulse duration longer than about 200
40 microseconds.

41 30. A method of claim 21, in which said ablative laser is fiber-coupled and combined with a
42 coagulation laser and delivered to the corneal surface.

43 31. A method of claim 21, in which said sclera tissue is ablated in radial patterns having a length
44 about (2.5-3.5) mm and a depth about (400-700) microns.

45 32. A method of claim 21, in which said sclera tissue is ablated in radial patterns by a computer-
46 controlled scanning mechanism.

47 33. A method of claim 21, in which said sclera tissue is ablated in radial patterns by a translation
mechanism.